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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/921,038	08/02/2001	Patrick Klersy	2024.25	9321
24963	7590	04/21/2004	EXAMINER	
ENERGY CONVERSION DEVICES, INC.			CAO, PHAT X	
2956 WATERVIEW DRIVE			ART UNIT	
ROCHESTER HILLS, MI 48309			PAPER NUMBER	

2814

DATE MAILED: 04/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/921,038	Applicant(s) KLEERSY ET AL.	
	Examiner Phat X. Cao	Art Unit 2814	<i>aw</i>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-27 and 60 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-27 and 60 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/6/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The cancellation of claims 1-20 and 28-59 in Paper filed 1/6/04 is acknowledged.

Claim Rejections - 35 USC § 112

2. Claim 60 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

New claim 60 is unclear. It is unclear because it depends on canceled claim 2-8.

For the examination purpose, it is assumed to depend on claim 21.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 21-24 and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wolstenholme et al (US. 5,998,244) in view of Batra et al (US. 6,242,781).

Wolstenholme (Fig. 6) discloses an electrically programmable memory element, comprising: a first dielectric layer 15; a first conductive layer 22 formed over the first dielectric layer 15; a second dielectric layer 45 formed over the first conductive layer 22, the second dielectric layer 45 having a pore 50 therein, the pore having a minimum lateral dimension of about 1000 angstroms (column 4, lines 17-18); a programmable resistance material 55 comprising a phase change material of chalcogen

element disposed within the opening; and a second conductive layer (60,65) formed over the programmable resistance material. Wolstenholme's Fig. 6 further discloses a third conductive layer 20 (or a sidewall layer) electrically coupled between the first conductive layer 22 and a substrate 5, wherein substantially all electrical communication between the second conductive layer (60,65) and the first conductive layer 22 is through an top edge portion of the third conductive layer 20.

Wolstenholme does not disclose a spacer disposed at a peripheral portion of the pore.

However, Batra's Fig. 7 teaches a contact opening having a spacer 68 formed at a peripheral portion of the pore. Accordingly, it would have been obvious to modify Wolstenholme's Fig. 6 by forming the spacer with the structure as set forth above in order to provide an ultra-small pore having a width which is less than the minimum available photolithographic feature size, as taught by Batra (column 6, lines 27-31).

5. Claims 25 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wolstenholme et al and Batra et al as applied to claim 21 above, and further in view of Tanahashi (US. 6,064,084).

Wolstenholme does not disclose the third conductive layer 20 being a conductive sidewall liner.

However, Tanahashi (Fig. 3C) teaches the forming of a contact structure having a conductive layer 55 electrically coupled to a substrate 51 through a conductive sidewall liner 53 formed in a dielectric layer 52. Accordingly, it would have been obvious to form the third conductive layer of Wolstenholme as a conductive sidewall

liner because as taught by Tanahashi, such conductive sidewall liner would reduce the contact resistance (column 10, lines 5-9).

Response to Arguments

6. Applicant argues that Wolstenholme and Batra are not analogous arts because Batra teaches an electrical contact having resistor formed in an opening and Wolstenholme teaches an electrical contact having memory material of a programmable resistance memory element formed in an opening.

This argument is not persuasive. One of ordinary skill in the art would have recognized the analogous art nature of the references because they both pertain to an interconnection having a conductive material formed in a contact hole. Furthermore, it would have been obvious to combine the references as suggested because Batra clearly suggests the motivation to combine (see ground of rejection for details).

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of


the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phat X. Cao whose telephone number is (571) 272-1703. The examiner can normally be reached on Monday - Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PC
April 16, 2004


PHAT X. CAO
PRIMARY EXAMINER